

WHAT IS CLAIMED IS:

1. An information processing system comprising:

a host processing device;

5 an external storage device that uses one or more physical devices to store data that are subjects of input/output requests from the host processing device; and

a control device intervening between the host processing device and the external storage device and that controls data receiving and sending, wherein
10 the control device determines whether an input/output request for a data block from the host processing device concerns a specific data space within a group of limited number of data spaces and determines a magnitude of impact that a look-ahead processing performed at present have on other input/output requests, and controls to load more data blocks than the data block that is a
15 subject of the input/output request onto a cache memory depending on a determination result when transferring to the host processing device the data block that is the subject of the input/output request from the host processing device.

20 2. An information processing system according to claim 1, wherein, when determining whether the input/output request at present concerns the specific data space, the control device determines whether the subject of the

input/output request concerns the group of data spaces, and increments an I/O count for the corresponding data space if the subject of the input/output request concerns the group of data spaces.

5 3. An information processing system according to claim 1, wherein, when determining whether the current input/output request concerns the specific data space, the control device determines whether the subject of the input/output request concerns the group of data spaces, and replaces a data space having the smallest I/O count with the data space that is subject of
10 input/output request, if the subject of the input/output request does not concern the group of data spaces.

 4. An information processing system according to claim 1, wherein, when determining whether the current input/output request concerns the
15 specific data space, the control device determines whether the subject of the input/output request concerns the group of data spaces, and determines that the input/output request at present concerns the specific data space if an I/O count for the corresponding data space exceeds a specified value.

20 5. An information processing system according to claim 1, wherein, when determining the magnitude of the impact the present look-ahead processing have on other input/output requests, the control device determines

that the impact is small if the sum of capacities of specified data spaces whose individual I/O counts exceed a certain value among the group of data spaces is equal to or less than a capacity of usable regions of the cache memory.

5 6. An information processing system according to claim 1, wherein the data space corresponds to one logic device.

7. An information processing system according to claim 6, wherein the data space corresponds to a specified region on the one logic device.

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8. An information processing system according to claim 1, wherein the data space corresponds to logically grouped external storage devices.

9. An information processing system according to claim 1, wherein,
15 when loading data blocks from the external storage device to the cache memory, the number of data blocks to be loaded onto the cache memory is changed such that the data blocks loaded onto the cache memory does not exceed a capacity of usable regions of the cache memory.

20 10. An information processing system according to claim 1, wherein, when a determination is made that the input/output request for the data block from the host processing device does not concern the specific data space,

the control device controls not to load from the external storage device any data block other than the data block that is the subject of the input/output request onto the cache memory.

5 11. An information processing system according to claim 1, wherein, when a determination is made that the look-ahead processing performed at present has a predetermined impact on other input/output requests, the control device controls not to load from the external storage device any data block other than the data block that is the subject of the input/output request
10 onto the cache memory.

 12. An information processing system according to claim 1, wherein each of the data blocks corresponds logical tracks.

15 13. An information processing system comprising:
 a host processing device;
 an external storage device that uses one or more physical devices to store data that are subjects of input/output requests from the host processing device; and
20 a control device intervening between the host processing device and the external storage device and that controls data receiving and sending, wherein the control device includes a cache memory that temporarily stores data that

are divided and managed in blocks of a specified size, a control information memory that stores monitoring information on usage status of the external storage device and the cache memory, and a control section that manages sets of the blocks as logical devices and that is connected to the cache memory and

5 the control information memory to control input/output of the blocks, wherein the control device, when transferring to the host processing device a data block that is a subject of a current input/output request from the host processing device, determines whether the current input/output request concerns a specific data space within a group of limited number of data spaces,

10 and determines a magnitude of impact that a look-ahead processing performed at present would have on other input/output requests, and loads, in addition to the block that is the subject of the current input/output request from the host processing device, one or more blocks in the specific data space from the external storage device to the cache memory, if the control device determines

15 that the current input/output request concerns the specific data space and that the impact that the look-ahead processing performed at present have on other input/output requests is a specified level or smaller.

14. An information processing system according to claim 13,

20 wherein, when determining whether the input/output request at present concerns the specific data space, the control device determines whether the subject of the input/output request concerns the group of data spaces, and

increments an I/O count for the corresponding data space if the subject of the input/output request concerns the group of data spaces.

15. An information processing system according to claim 13,
5 wherein, when determining whether the current input/output request concerns the specific data space, the control device determines whether the subject of the input/output request concerns the group of data spaces, and replaces a data space having the smallest I/O count with the data space that is subject of input/output request, if the subject of the input/output request does
10 not concern the group of data spaces.

16. An information processing system according to claim 13,
wherein, when determining whether the current input/output request concerns the specific data space, the control device determines whether the
15 subject of the input/output request concerns the group of data spaces, and determines that the input/output request at present concerns the specific data space if an I/O count for the corresponding data space exceeds a specified value.

20 17. An information processing system according to claim 13,
wherein, when determining the magnitude of the impact the present look-ahead processing have on other input/output requests, the control device

determines that the impact is small if the sum of capacities of specified data spaces whose individual I/O counts exceed a certain value among the group of data spaces is equal to or less than a capacity of usable regions of the cache memory.

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18. An information processing system according to claim 13, wherein the data space corresponds to one logic device.

19. An information processing system according to claim 18, wherein
10 the data space corresponds to a specified region on the one logic device.

20. An information processing system according to claim 13, wherein the data space corresponds to logically grouped external storage devices.

15 21. An information processing system according to claim 13, wherein, when loading data blocks from the external storage device to the cache memory, the number of data blocks to be loaded onto the cache memory is changed such that the data blocks loaded onto the cache memory does not exceed a capacity of usable regions of the cache memory.

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22. An information processing system according to claim 13, wherein, when a determination is made that the input/output request for the

data block from the host processing device does not concern the specific data space,

the control device controls not to load from the external storage device any data block other than the data block that is the subject of the input/output

5 request onto the cache memory.

23. An information processing system according to claim 13, wherein, when a determination is made that the look-ahead processing performed at present has a predetermined impact on other input/output

10 requests, the control device controls not to load from the external storage device any data block other than the data block that is the subject of the input/output request onto the cache memory.

24. An information processing system according to claim 13, wherein

15 each of the data blocks corresponds logical tracks.